

# Net-Centricity and Net-Centric Enterprise Services (NCES) Program

May 12, 2004

Mike Krieger  
Director Information Management  
Office of the Deputy DoD CIO  
[michael.krieger@osd.mil](mailto:michael.krieger@osd.mil)



## DoD Transformation – the “Net-Centricity” Vision

“The two truly transforming things might be in information technology and information operating and networking... connecting things in ways that they function totally differently than they had previously.”

“And if that’s possible... then possibly the single most transforming thing in our Force will not be a weapon system, but a set of interconnections and a substantially enhanced capability because of that awareness.”

Secretary of Defense Donald Rumsfeld,  
9 August 2001



**Key Transformational Concept: Global Information Grid (GIG)**



## The DoD Global Information Grid (GIG)

- An organizing and transforming construct for managing information technology in the Department of Defense.
- Essential to achieving the Department's transformation to a net-centric organization.
- The basis for information technology policy, governance, capital planning, funding strategies, and capabilities development.
- A system of information technology capabilities, systems, processes, services, facilities, and personnel – the *implementation component* of the GIG.
- Exists today and is described in a baseline (current) architecture.



## Topics

- What is:
  - Net-Centricity?
  - GIG Governance?
  - EIEMA Goals, Vision and Relationship?
  - Net-Centric Data Strategy?
  - NCES Program?
- How will the Department move to Net-Centricity?





## Definitions

**Network Centric Warfare:** Warfighting that employs the benefits of dramatically enhanced quality and timeliness of information as well as fully transparent interoperability of both systems and organizations. It is enabled by Net-Centricity.

**Net-Centricity** (noun): A robust, globally interconnected, network environment (including infrastructure, systems, processes, people) in which data is shared timely and seamlessly among users, applications and platforms. Net-Centricity enables substantially improved military situational awareness and significantly shortened decision making cycles.

**Net-Centric** (adjective): Relating to or representing the attributes of Net-Centricity



## Net-Centric Attributes

- **Internet Protocol version 6 (IPv6)** – IP, not point-to-point
- **Security** – IA enabled and encrypted comms
- **Dynamic allocation of access** – trusted access to net resources
- **Only handle information once** – data posted by authoritative sources and visible
- **Post in parallel** – data posted as it is created
- **Smart pull** – applications encourage data discovery
- **Data centric** – data separate from applications
- **Application diversity** – applications posted for use
- **Quality of service** – data timeliness, accuracy, completeness, ease of use



Net-Centric checklist can be found at <http://www.dod.mil/nii/doc/>

GIG Governance...

## Governance of GIG Capabilities

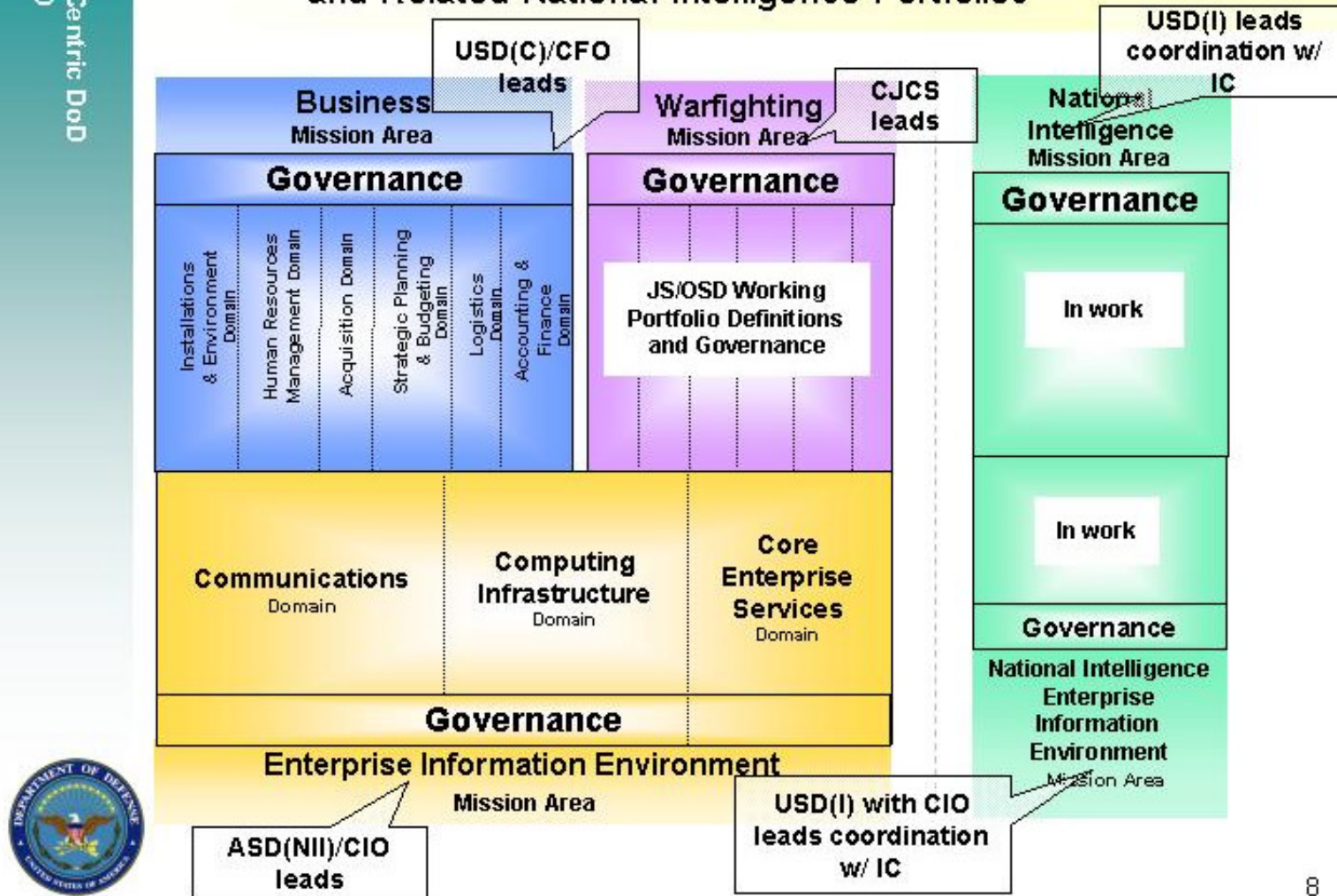
- **Net-centricity demands a new approach to data management and IT systems engineering and requires appropriate governance**
  - Leverage DoD decision processes (acquisition, requirements, and planning & budgeting)
- **Service-oriented environment requires management of interoperable architectures and capability portfolios:**
  - Strategic Planning Guidance FY 2006-2011, March 2004
    - Directs efforts to improve information sharing capabilities to comply with the Net-Centric Data Strategy
    - Directs Components to support organizing concepts of Mission Areas and to resource/enable Communities of Interest (COIs)
  - DepSecDef memo on IT Portfolio Management, March 2004
    - Establishes policy that information technology investments be managed as portfolios
    - Directs a governance framework to manage DoD IT (including NSS) investments as portfolios by Mission Area Leads
    - Identifies responsibilities activities for the management of the portfolios





GIG Governance...

## DoD Portfolios and Related National Intelligence Portfolios



EIEMA ...

## EIEMA VISION and Goals

### VISION

- Support the Warfighter, DoD portion of National Intelligence, and Business Mission Areas by providing a common Enterprise Information Environment (EIE) foundation for network-centric operations

### GOALS

- Achieve a ubiquitous, secure and robust global DoD network
- Eliminate bandwidth and computing capability limitations
- Deploy collaborative capabilities and other enterprise-wide performance support services
- Secure and assure the network and the information
- Achieve an appropriate end-to-end Quality of Service (QoS) to support DoD mission capabilities

*(derived from a subset of DoD CIO goals)*



EIEMA ...

## Criteria for Scoping EIEMA

EIEMA portfolio includes the common communications, computing and core enterprise services that are part of the GIG, support the Warfighter, DoD portion of National Intelligence, and Business Mission Areas, and have the following characteristics:

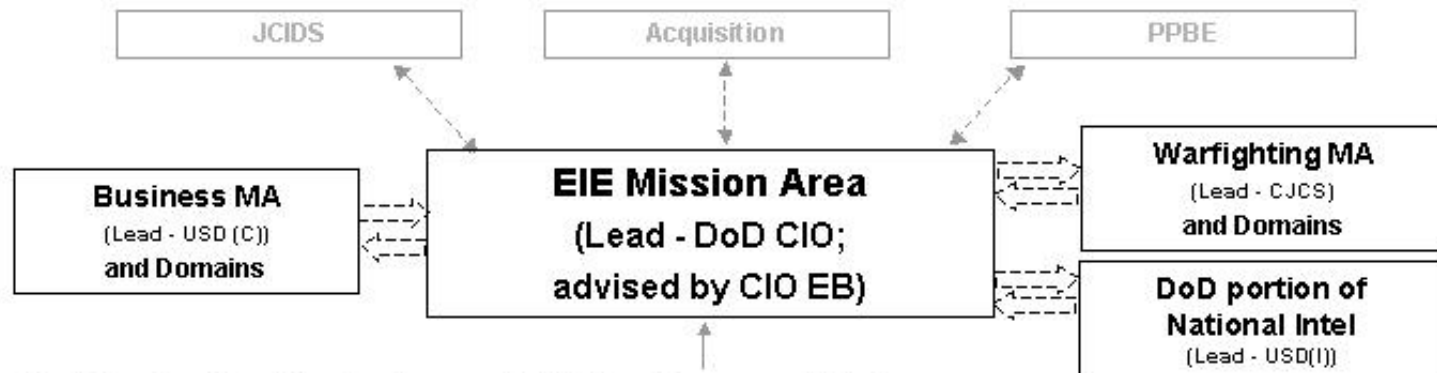
- a. **Meets the stated vision and goals for the EIE Mission Area**
  - b. **Consists of owned or leased communications or computing systems and services** (DoDD 8100.1)
  - c. **Provides communications, computing and core enterprise services common to more than one mission area** (EIEMA tiger team proposed criteria)
  - d. **Best-value if provided at the enterprise level and is consistent with national military strategy and operational requirements** (derived from DoDD 8100.1)
  - e. **Comprises part of the critical information infrastructure supporting the operation of the Department** (GAO/AIMD-10.1.23)
- Above criteria are necessary, but not sufficient, for deciding to include or exclude any program, project or system in the EIEMA
    - Portfolio definition must be accomplished by a methodical process involving all Mission Area leads based on recommendations from Domain owners & Services





EIEMA ...

### Relationship between EIEMA and Other MAs



**Relative to other Mission Areas, EIEMA lead is responsible to:**

- Coordinate with other Mission Areas to determine which MA is responsible for necessary information capabilities and services**
- Ensure that information capability needs that are identified to EIEMA by other MAs get assigned to an EIEMA domain**
- Work with other MAs to ensure necessary EIEMA capabilities are addressed within an EIE domain**
- Ensure EIEMA decisions are based on systems engineering analyses that optimize the enterprise capabilities in support of other mission area needs**
- Assess quality of service and effectiveness of EIEMA capabilities in supporting other Mission Areas**
- Share best practices**



The Net-Centric Data Strategy...

## Data Strategy Overview

- The Net-Centric Data Strategy (signed May 9, 2003) sets the vision for the Department's data transformation:
  - ✓ Ensuring data are **visible, accessible, and understandable** when needed and where needed to accelerate decision making
  - ✓ **"Tagging"** of all data (intelligence, non-intelligence, raw, and processed) with metadata to enable discovery by known and unanticipated users in the Enterprise
  - ✓ **Posting** of all data to shared spaces for users to access except when limited by security, policy, or regulations
  - ✓ Organizing around **Communities of Interest** (COIs) that are supported by Domains within the Warfighter, Business, and Intelligence Mission Areas.

*The Strategy describes key goals to achieving net-centric data management...*

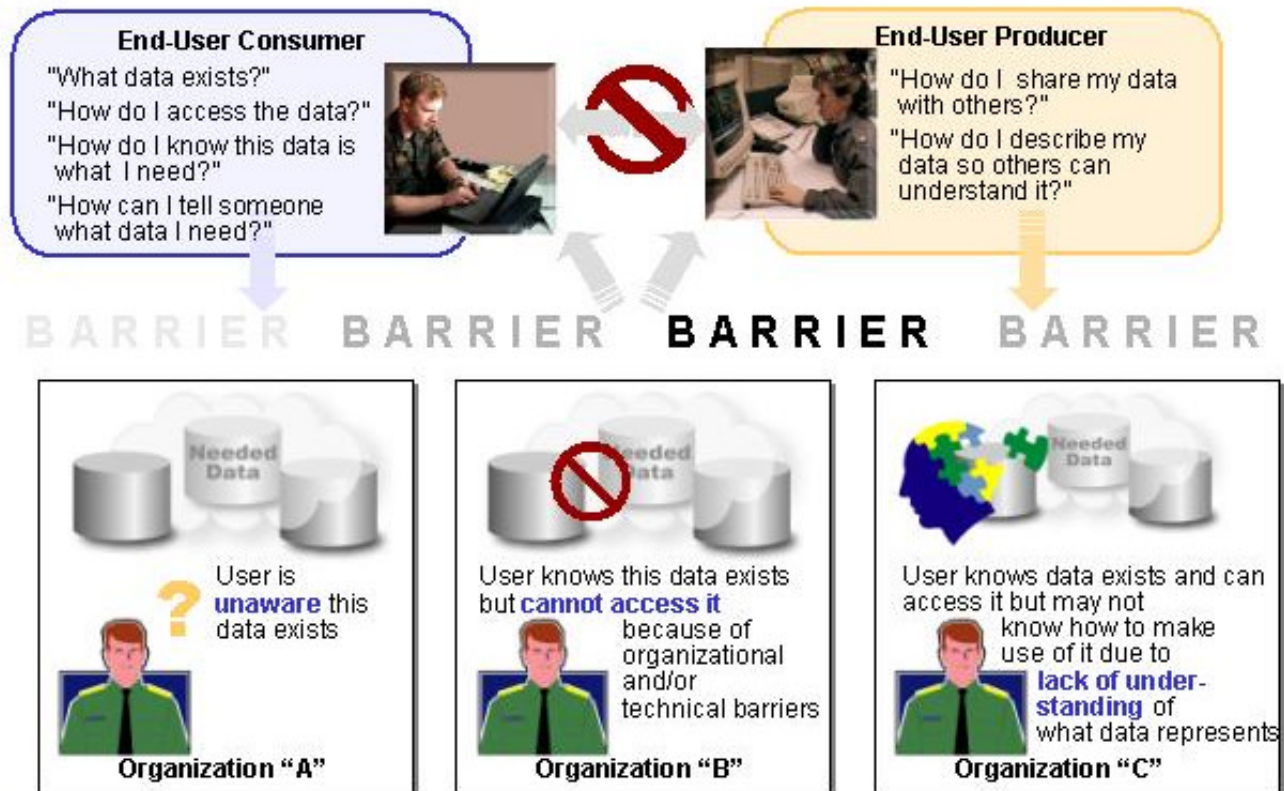
Data Strategy can be found at <http://www.dod.mil/nii/doc/>



The Net-Centric Data Strategy...

# Barriers to Identifying, Accessing and Understanding Data

Defining The Data Problem



## The Net-Centric Data Strategy...

# Key Goals and the Importance of Metadata

### Key Goals:

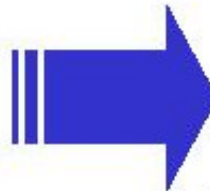
Make Data Visible

Make Data  
Accessible

Make Data  
Understandable

Enable Data to be  
Trusted

Make Data  
Interoperable



### Key Actions:

#### ✓ Make Data Assets Available to the Enterprise:

- Use metadata to describe and advertise data assets
- Create searchable metadata catalogs and organize by published taxonomies
- Make Data Assets available through convenient access to 'shared space'

#### ✓ Make *System Data and Capabilities* Available to the Enterprise:

- Define and register the format and semantics of data assets
- Provide and use 'enterprise services' to make system data and business logic available to GIG users

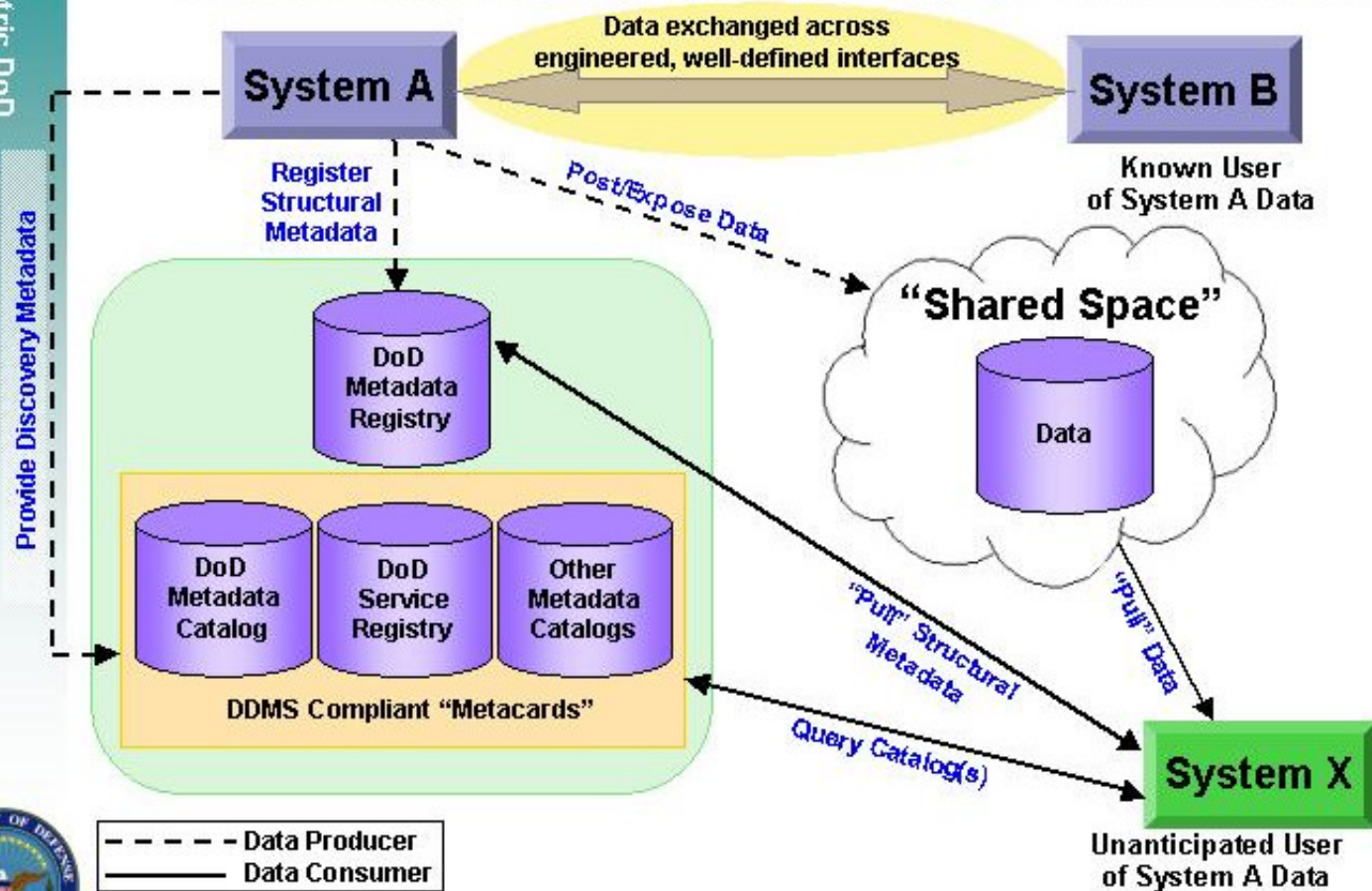




The Net-Centric Data Strategy...

## Enabling the Unanticipated User

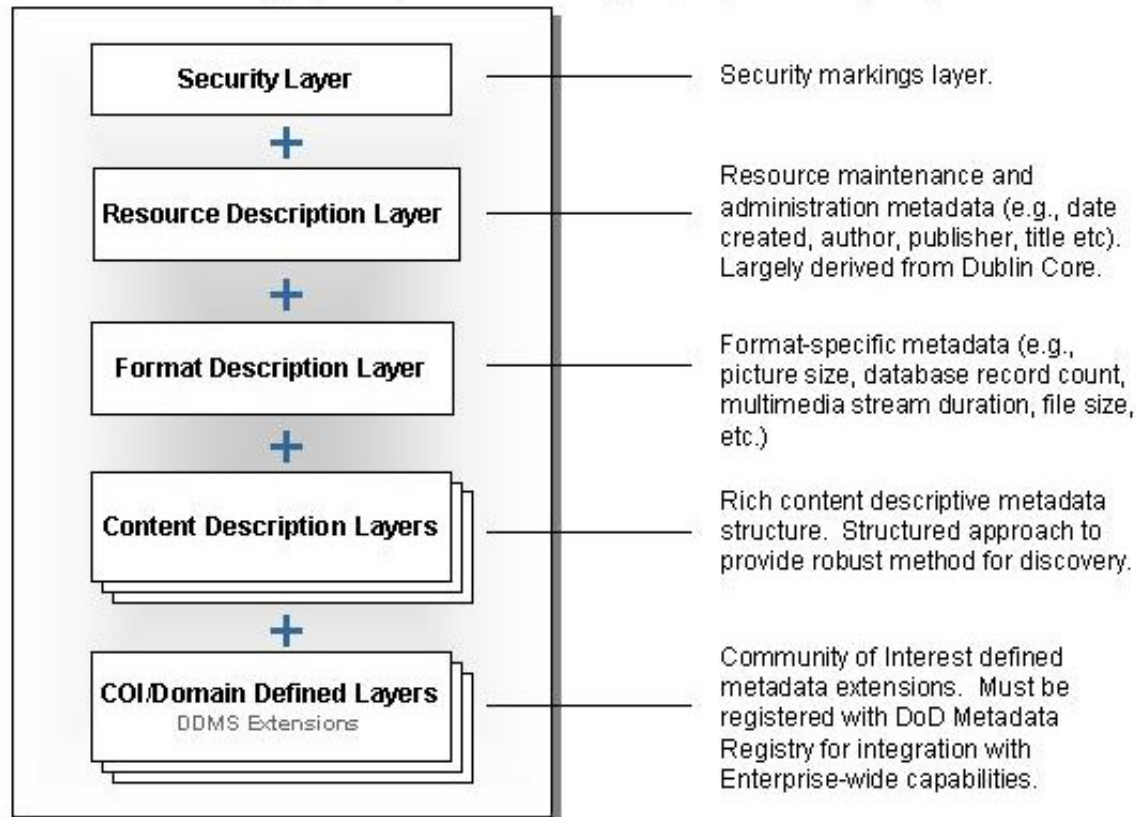
Focus of Existing Data Administration Policy is Pre-defined Point-to-Point Interfaces



The Net-Centric Data Strategy...

## DoD Discovery Metadata Specification (DDMS)

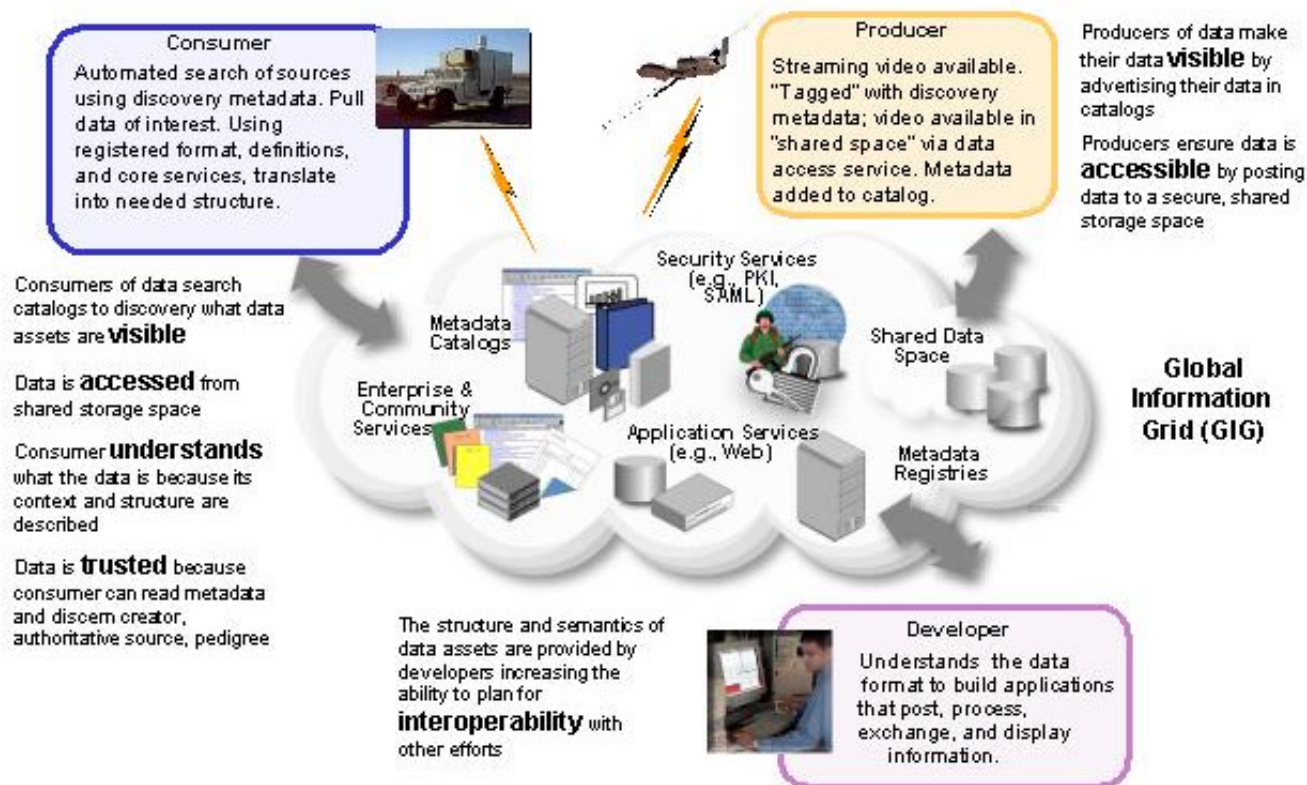
**Provides a consistent way to describe and search for data assets (e.g. documents, images, enterprise services, people, metadata, etc)**





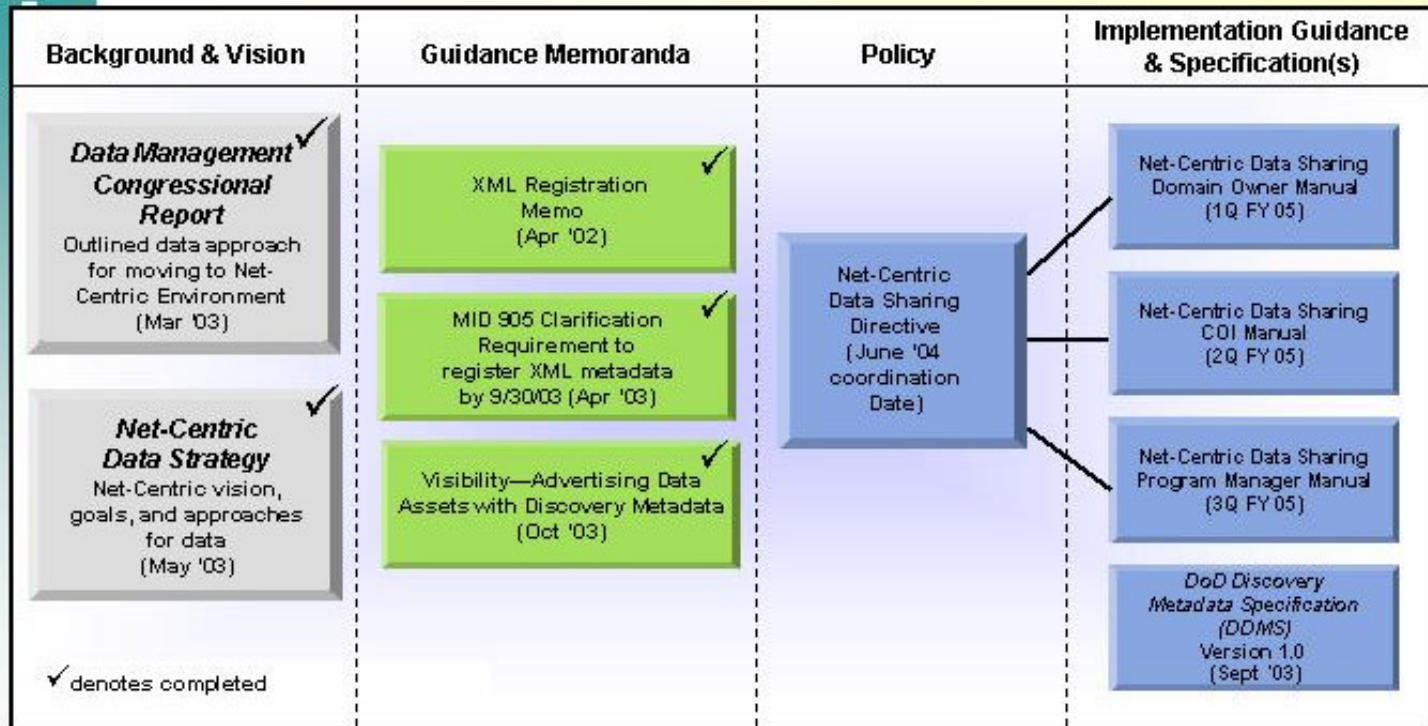
## The Net-Centric Data Strategy...

# Net-Centric Data CONOPS



## The Net-Centric Data Strategy...

# Codifying the Strategy & Providing Guidance



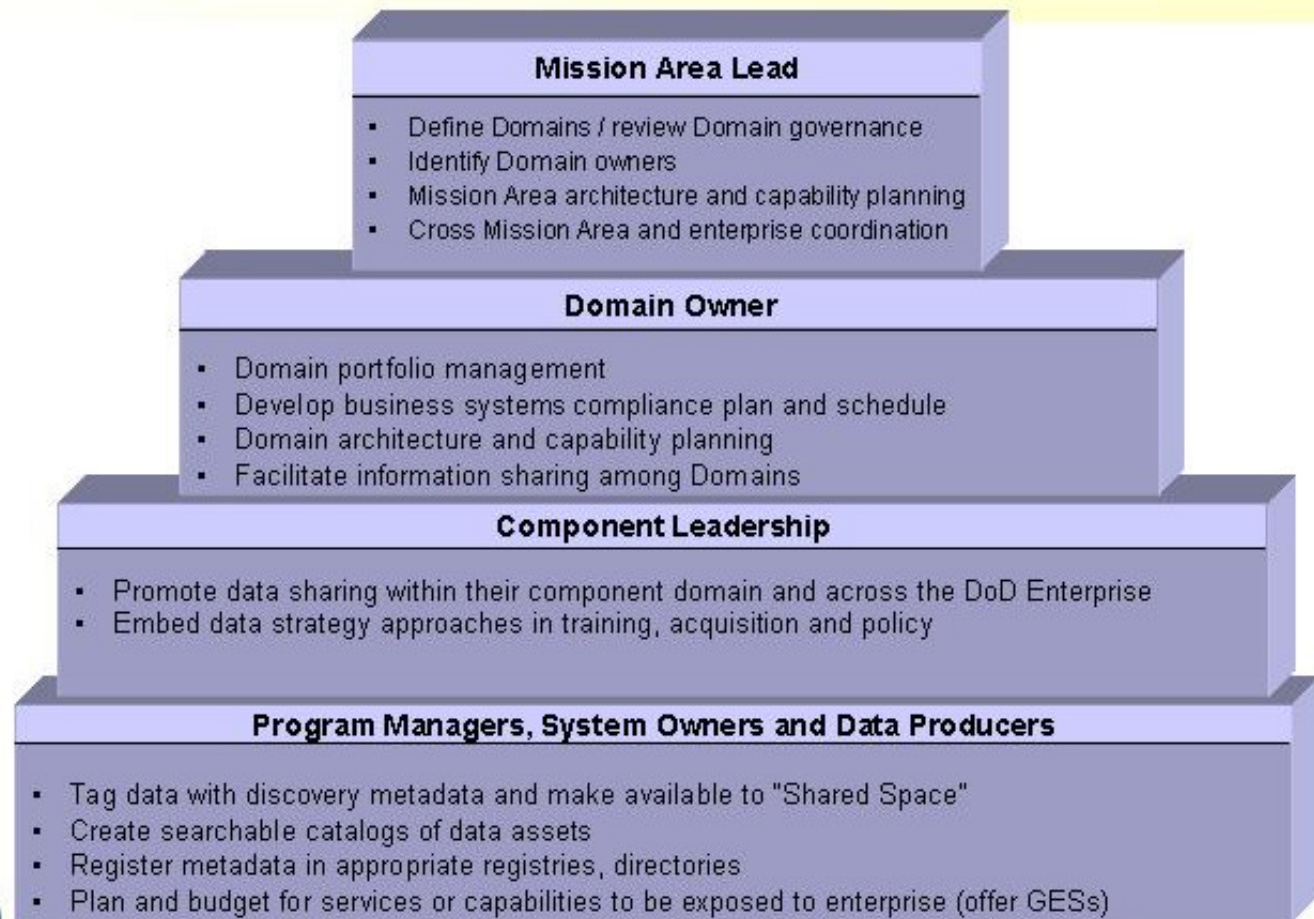
### Other related guidance and direction:

- GIG Core Enterprise Services (CES) Implementation Memo (Nov '03)
- Strategic Planning Guidance FY 2006-2011, (March '04)
- IT Portfolio Management Memo (Mar '04)



## The Net-Centric Data Strategy...

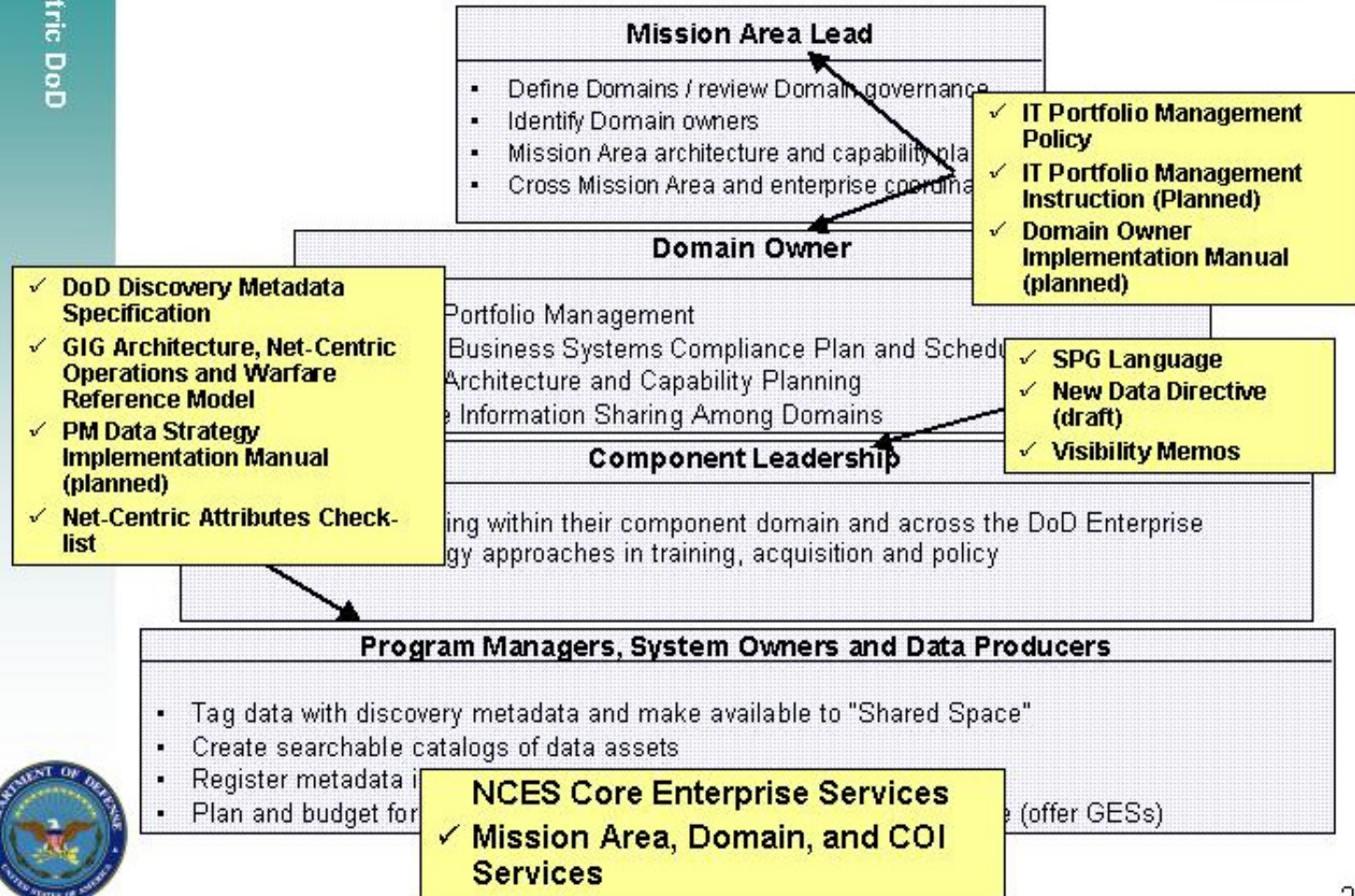
### Who Does What





## The Net-Centric Data Strategy...

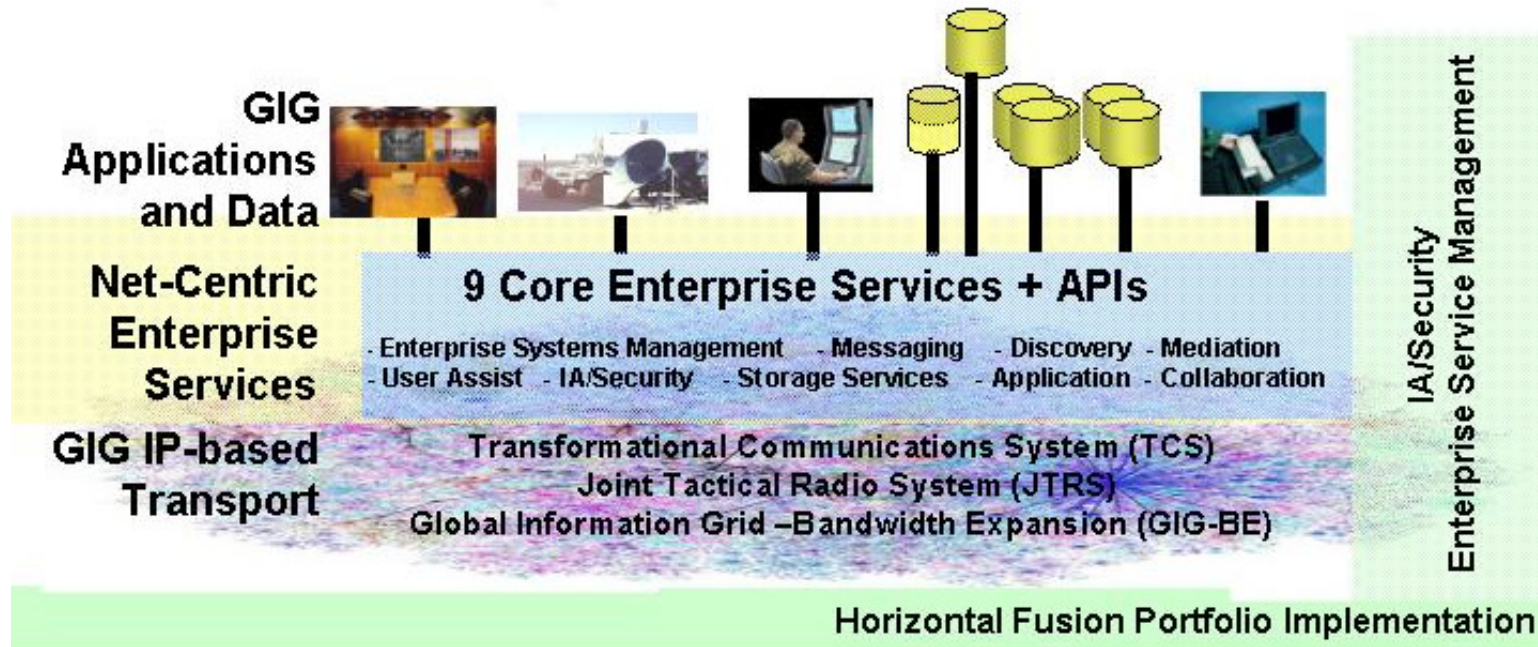
# What Policy and Guidance Exists



The NCES Program...

# Global Information Grid Net-Centric Detail

Enables rapid exploitation of diverse data sources by  
GIG users in a manner that can be customized to  
meet specific mission demands

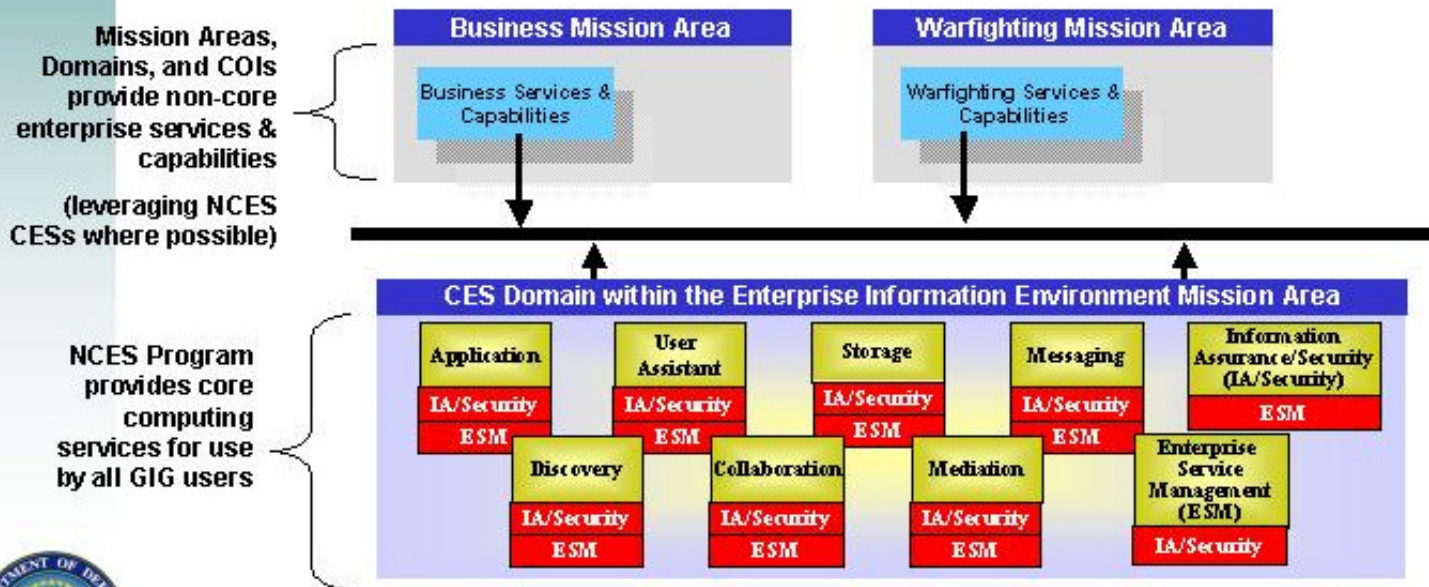




The NCES Program...

## Net-Centric Enterprise Services (NCES)

- **NCES FY04 new start program – MS A May 04:**
  - Establishes a service-oriented architecture (SOA) and enterprise-wide capabilities to enable goals of the data strategy and net-centricity
  - Provides a set of core computing capabilities from which other Enterprise capabilities can integrate and/or extend:





The NCES Program...

## NCES Objectives

- Deliver capabilities-based service infrastructure for ubiquitous access to timely, secure, decision quality information by edge users
- Enable information providers to post any information they hold
- Enable edge users to:
  - rapidly and precisely discover and pull information resources
  - dynamically form collaborative groups for problem solving
- Provide security for, and coordinated management of, netted information resources
- Data interoperability versus application interoperability



The NCES Program...

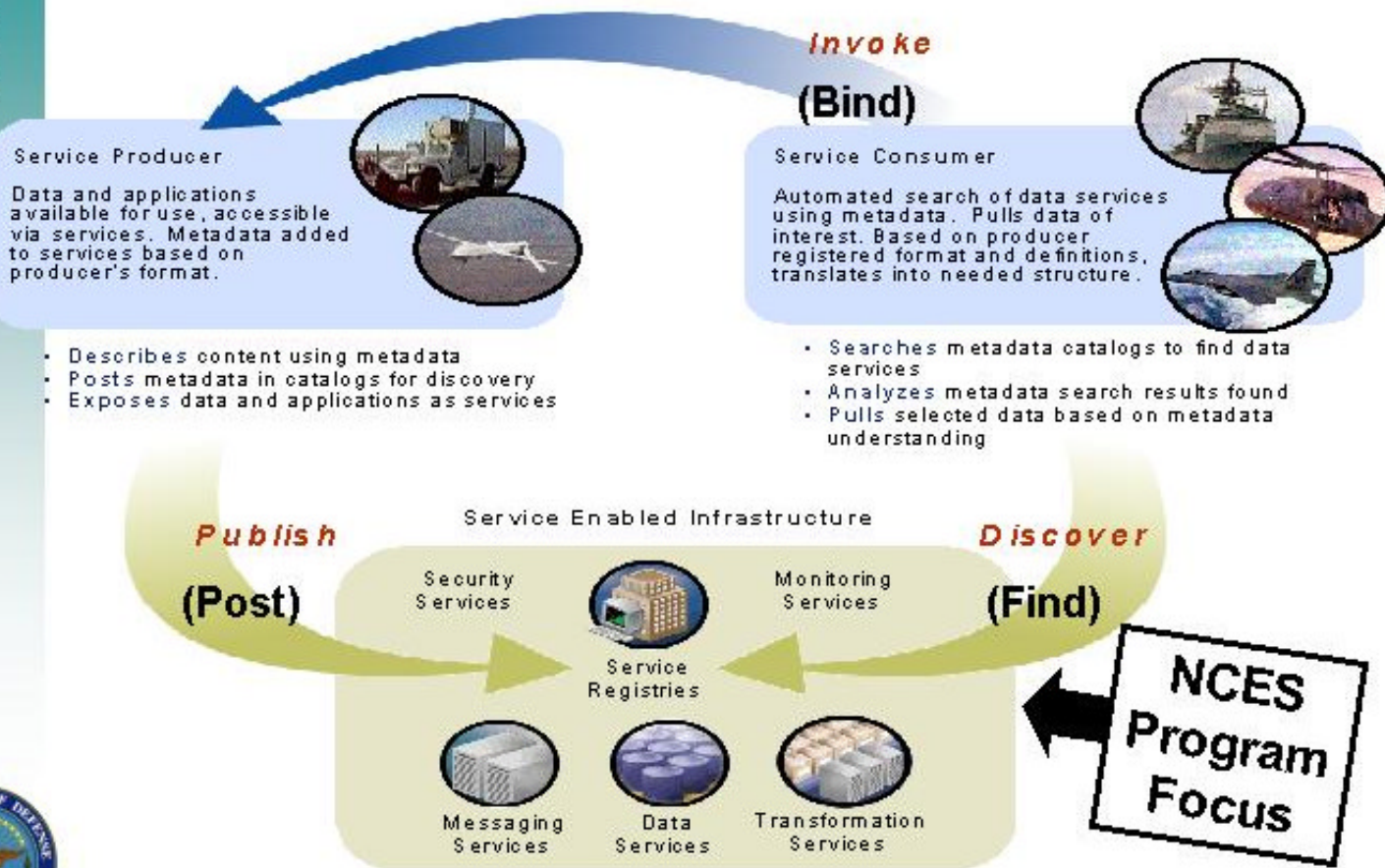
## D R A F T NCES Fielding Schedule

- Increment 1 – FY05-07
  - Host at DISA computing centers (NIPRNET, SIPRNET, and GIG-BE (IPv6))
  - Supports GIG users with “always-on” connectivity
- Increment 2 – FY07-09
  - Extend to tactical users by hosting on tactical networks (e.g. WIN-T, maritime platforms)
  - Supports tactical GIG users with intermittent connectivity
- Increment 3 – FY09-11
  - Additional capabilities and functionality
  - Scale to DoD Enterprise



The NCES Program...

# Service Oriented Architecture

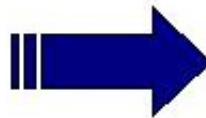


The NCES Program...

## Why SOA and Web Services?



Discoverable



- Better reuse of software components
- Enables rapid service assembly
- Better return on investment



Highly  
Interoperable



- Platform and language independent
- Leverage existing IT investments



Loosely Coupled and Decentralized



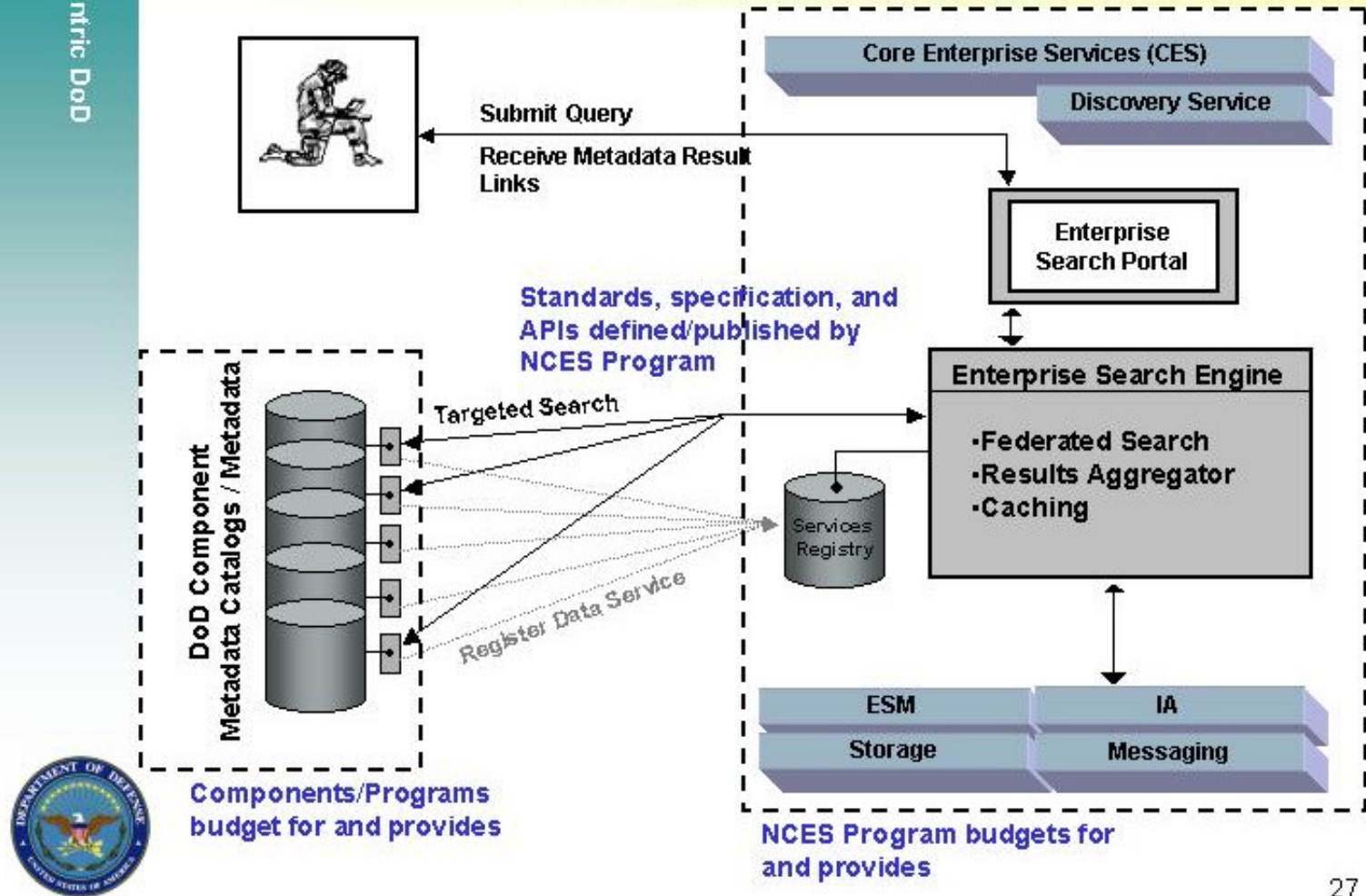
- Agility
- Location transparency
- High availability
- Emphasis on business logic and less on plumbing





The NCES Program...

## Example of Enterprise Discovery Enabled by NCES Capabilities



Transition...

# Core Enterprise Services Implementation Memo



DEPUTY SECRETARY OF DEFENSE  
1010 DEFENSE PENTAGON  
WASHINGTON, DC 20301-1010

Nov 10, 2003

NOV 10 2003

MEMORANDUM FOR: SECRETARIES OF THE MILITARY DEPARTMENTS  
CHAIRMAN OF THE JOINT CHIEFS OF STAFF  
UNDER SECRETARIES OF DEFENSE  
COMBATANT COMMANDERS  
ASSISTANT SECRETARIES OF DEFENSE  
GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE  
DIRECTOR, OPERATIONAL TEST AND EVALUATION  
INSPECTOR GENERAL OF THE DEPARTMENT OF DEFENSE  
ASSISTANTS TO THE SECRETARY OF DEFENSE  
DIRECTOR, ADMINISTRATION AND MANAGEMENT  
DIRECTOR, PROGRAM ANALYSIS AND EVALUATION  
DIRECTOR, NET ASSESSMENT  
DIRECTOR, FORCE TRANSFORMATION  
DIRECTORS OF THE DEFENSE AGENCIES  
DIRECTORS OF THE DOD FIELD ACTIVITIES

SUBJECT: Global Information Grid Enterprise Services (GIG ES): Core Enterprise Services (CES) Implementation

This memorandum provides guidance for existing and future acquisition programs to implement the plans for Global Information Grid Enterprise Services (GIG ES). The DoD information environment is moving from broadcast and point-to-point communications to a networked environment based on the principles of "push before process" and data level interoperability. This networked information technology and architecture will improve the speed and quality of DoD decision-making. The networked environment will (1) support posting data to shared spaces as early as possible; (2) provide users with the improved capability to pull whatever data they need, whenever they need it, from wherever they are; (3) ensure information assurance measures are applied effectively and on an enterprise basis; and (4) provide enterprise timing and synchronization services.

Robust GIG ES-CES (e.g., messaging, collaboration, services management, security, discovery, evaluation) will provide visibility, access and delivery of data and information services across the DoD. GIG ES-CES also enable users to search the enterprise for, and establish a connection to, information or service. These services and capabilities represent a fundamental shift to a service-oriented paradigm requiring a ubiquitous network environment, richly populated with information of value, readily available, secure, reliable and usable throughout DoD. To the maximum extent possible, and without declassifying the inherent and stand-alone capabilities and effectiveness of our future missions, platforms and systems of systems, the GIG ES-CES shall leverage existing Military Department and Agency enterprise service initiatives. In addition, the GIG ES-CES will be designed to take advantage of existing services using a federated approach as part of their implementation. An overview of the Net-Centric Operations and Warfare (NCOW) Reference Model and an executive paper elaborating further on GIG ES-CES are available electronically at <http://www.dod.mil/milinfo/>.

The FY 2006 program review will be used to begin influencing the shift to mandating core enterprise services within the GIG. The DoD CIO and USDI/AT&L, in coordination with appropriate stakeholders, will issue guidance NLT February 2004, outlining threat and information requirements for the Department's transition to a net-centric environment. As a minimum, the guidance will require agencies to address the Department's Net-Centric Data Strategy and Information Assurance Strategy, alignment with the NCOW Reference Model, transition priorities, and budget plans and schedules to implement GIG ES-CES. Based on the DoD CIO and USDI/AT&L guidance, each DoD Component will develop GIG ES transition plans for the DoD CIO for use during the FY 2006 program review.

All fielded C2, Combat Support and Intelligence Systems supporting the Joint Task Force and Coalition Commanders will continue to use and implement the Defense Information Infrastructure Common Operating Environment (COE) until the use of GIG ES-CES are mandated and a transition plan can be executed. All applications of a system that must be integrated into the COE shall be at least COE Level 5 compliant.

Your continued support for the Department's transformation is critical. The DoD CIO and USDI/AT&L will establish teams, as necessary, to accomplish the transition to a net-centric environment using core enterprise services. Please direct any questions to Ms. Linda Bagby at 703-602-0867 or Linda.Bagby@oas.mil.

cc:  
DoD Chief Information Officers  
Director of Central Intelligence  
Intelligence Community Chief Information Officer

*Paul W. Wolfowitz*

"The FY 2006 program review will be used to begin influencing the shift to mandating core enterprise services within the GIG."

"This memorandum provides guidance for existing and future acquisition programs to implement the plans for Global Information Grid Enterprise Services (GIG ES)."



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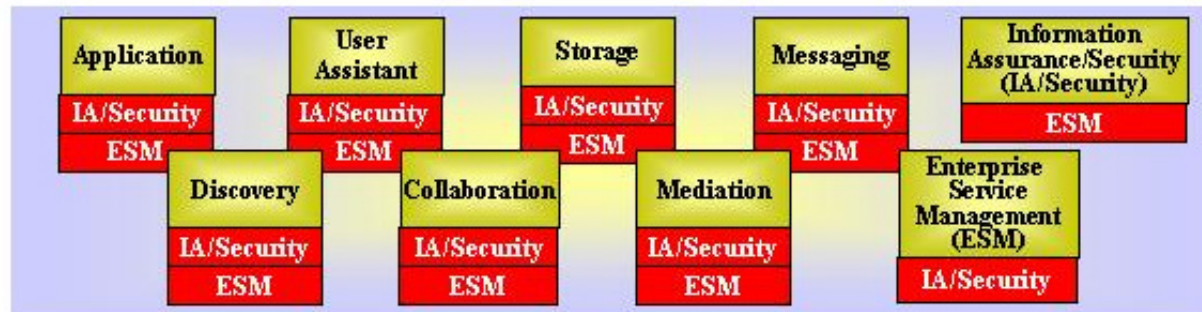




## Net-Centric Attributes

Title	Description	Metric	Source
Internet Protocol (IP)	Data packets routed across network, not switched via dedicated circuits	IP as the Convergence Layer Net-Centric Operations and Warfare Reference Model (NCOW RM), Technical View compliant with Joint Technical Architecture (JTA)	NCOW RM, GIG Arch v2, IPv6 Memos (9 Jun 03 and 29 Sep 03), JTA Memo, Nov 24, '03 JTA v6.0
Secure and available communications	Encrypted initially for core network; goal is edge-to-edge encryption and hardened against denial of service	Black Transport Layer Transformational Communications Architecture (TCA) compliance; Technical View compliant with JTA	TCA; IA Component of Assured GIG Architecture; JTA Memo, Nov 24, '03 JTA v6.0
Only handle information once (OHIO)	Data posted by authoritative sources and visible, available, usable to accelerate decision making	Reuse of existing data repositories	Community of interest policy (TBD)
Post in parallel	Business process owners make their data available on the net as soon as it is created	Data tagged and posted before processing NCOW RM, Technical View compliant with JTA	NCOW RM, DoD Net-Centric Data Strategy (May 9, '03); JTA Memo, Nov 24, '03 JTA v6.0
Smart pull (vice smart push)	Applications encourage discovery; users can pull data directly from the net or use value-added discovery services	Data stored in public space and advertised (tagged) for discovery NCOW RM, Technical View compliant with JTA	NCOW RM; DoD Net-Centric Data Strategy (May 9, '03); JTA Memo Nov 23, '03 JTA v6.0
Data centric	Data separate from applications; apps talk to each other by posting data	Metadata registered in DoD Metadata Registry NCOW RM, Technical View compliant with JTA	NCOW RM; DoD Net-Centric Data Strategy (9 May 03); JTA Memo, Nov 24, '03 JTA v6.0
Application diversity	Users can pull multiple apps to access same data or choose same app (e.g., for collaboration)	Apps posted to net and tagged for discovery NCOW RM, Technical View compliant with JTA	NCOW RM; JTA Memo, Nov 24, '03 JTA v6.0
Assured Sharing	Trusted accessibility to net resources (data, services, apps, people, collaborative environment, etc.)	Access assured for authorized users; denied for unauthorized users	Security/IA policy Nov 21, '03; IA Component of Assured GIG Architecture; JTA Memo, Nov 24, '03 JTA v6.0
Quality of service	Data timeliness, accuracy, completeness, integrity, and ease of use	Net-ready key performance parameter	Service level agreements (TBD); JTA Memo, Nov 24, '03 JTA v6.0

## Core Enterprise Services Delivered by NCES



**Application** - The set of services necessary to provision, host, operate and manage the GIG ES assured computing environment.

**User Assistant** - Automated capabilities that learn and apply user preferences and patterns to assist users to efficiently and effectively utilize GIG resources in the performance of tasks.

**Storage** - The set of services necessary to provide on demand posting, storage and retrieval of data.

**Messaging** - Provides services to support synchronous and asynchronous information exchange.

**Collaboration** - services that allows users to work together and jointly use selected capabilities on the network (i.e., chat, online meetings, work group software etc.)

**IA/Security** - The set of services that provide a layer of Defense in Depth to enable the protection, defense, integrity, and continuity of the information environment and the information it stores, processes, maintains, uses, shares, disseminates, disposes, displays, or transmits.

**Discovery** - services that enable the formulation and execution of search activities to locate data assets (e.g., files, databases, services, directories, web pages, streams) by exploiting metadata descriptions stored in and or generated by IT repositories (e.g., directories, registries, catalogs, repositories, other shared storage).

**Mediation** - services that enable transformation processing (translation, aggregation, integration), situational awareness support (correlation and fusion), negotiation (brokering, trading, and auctioning services) and publishing.

**ESM** - services that enable the life cycle management of the information environment and supports the performance of the NetOps activities necessary to operationally manage information flows in the information environment.

**\*\* Candidate Enterprise Services provided for use by FY04 Horizontal Fusion initiatives**









